

## NEW RECORDS OF MONONCHIDA: MONONCHIDAE,

### RAJAJI NATIONAL PARK, UTTARAKHAND, INDIA

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#### ABSTRACT

Two new records of predatory nematodes categorized under order Mononchida Jairajpuri, 1969 and the family Mononchidae Filipjev, 1934 discovered from Rajaji National Park, Uttarakhand, India. *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 reported for the first time from India after the last time it was originally identified by Eroshenko (1972) and *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 recorded first time from the state of Uttarakhand and second time from India after Jairajpuri & Khan (1982) located the specimen from Himachal Pradesh. The current findings made an addition in the list of predatory nematodes reported from India and the state of Uttarakhand as well.

**KEYWORDS:** New Records, *Coomansus arvensis*, *Coomansus venezolanus*, Rajaji National Park, Uttarakhand, India

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#### INTRODUCTION

*Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 originally elaborated by Eroshenko (1972) as *Clarkus arvensis* under the family Mononchidae of carnivorous nematodes Mononchida from the soil in the Primorsk Territory (Far-Eastern USSR). The mentioned specimen close to the type specimen of genus *Coomansus*, i.e., *Coomansus parvus* (de Man, 1880) Jairajpuri & Khan, 1977 but differed only in the position of dorsal-tooth apex located in anterior-fourth of buccal-cavity instead of anterior-third and that of the *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 but varied in the body-length, stoma-size and location of dorsal-tooth apex in the buccal-cavity. *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 (Mononchida: Mononchidae) initially explained by Loof (1964) as *Mononchus venezolanus* reported from El Jarillo, Venezuela. After the establishment of new genus *Coomansus* by Jairajpuri & Khan, 1977 *Mononchus venezolanus* Loof, 1964 transferred to new genus *Coomansus*. Jairajpuri & Khan, 1982 reported *Coomansus venezolanus* from the soil around the roots of grasses from Dalhousie, Himachal Pradesh and named it as *Coomansus icarus* Jairajpuri & Khan, 1982. Vu Thi Thanh Tam, 2016 reported *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 female and first male specimen of the same from Cao Loc, Lang Son province, Vietnam which corresponded well with the previous description of *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982. India previously reported 10 species of *Coomansus* with 5 species identified from the state of Uttarakhand. This current survey added one new species reported from Uttarakhand and another new species reported from India as well as Uttarakhand.

## MATERIALS AND METHODS

### Studied Ranges

Uttarakhand, the state of northern part of India continued to exhibit great diversity of Himalayan region. Rajaji National Park one of the valuable protected areas, second tiger reserve in the state of Uttarakhand and 48<sup>th</sup> National Park of India encircled the Shivalik, close to the foothills of Himalayas spread over 820 sq. km. of areas. Chilla, Motichur and Rajaji sanctuaries together built this protected area nestled between Shivalik ranges and Indo-Gangetic plains with coordination of 30°03'29"N 78°10'22"E. The current study from 2013 to 2016 on most abundant soil metazoans, nematodes covered varied ranges of Rajaji National Park. Among the localities and surrounding areas of the covered ranges these two species found from Ramgarh Range and Hazara Range from the host species Sal *Shorea robusta* and Sagun *Tectona grandis* respectively.

### Steps of Sample-Processing for Analysis

Soil samples collected from the roots of representative forest host trees and carried to the laboratory within labelled air-tight polybags. During sample collections valuable data addition regarding localities, coordination, host species, date of collection etc. got special attention. Collected samples went under processing following the modified Baermann's (1917) funnel technique. Processing followed by killing and fixation in 4% hot formalin. Dehydration in the fixative for 2-3 weeks came next in the process which made the specimens ready for preparation of permanent slides and finally identifications, the final stage of analysis. The reported species of genus *Coomansus* have been identified-measured with the help of Olympus BX41 microscope, photographed using Olympus BX51 microscope and edited by Microsoft Office Picture Manager. The reported specimens have been registered and deposited in National Zoological Collection, Zoological Survey of India, Northern Regional Centre, Dehra Dun, Uttarakhand, India.

## RESULTS

### *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 (Figure 1. A-D)

**Measurements:** *Female* (1): L= 1.19 mm; a= 18; b= 3.2; c= 14; c'= 2.3; V= 63.

### Description

Small-sized nematode approx. 1.2 mm, less than 1.5mm long. Posture upon fixation ventrally arcuate maximally curved towards ventral side. Lip region markedly offset comparing the adjacent cephalic region with 31 µm width and 10 µm long. Buccal-cavity 31 µm long and 17 µm wide, strong sclerotization on buccal-walls. Dorsal-tooth apex finely-pointed anteriorly within the one-fourth range of buccal-cavity, situated at 84% of buccal-cavity height from basal end and 16% of buccal-cavity height from frontal end. No evidence of longitudinal ridges on subventral walls of buccal-cavity. Pharynx 373µm long. Pharyngo-intestinal junction non-tuberculate. Reproductive system amphidelphic, with unequal length of sexual-branches and transverse slit-like vulval opening. Tail had ventral hook-like curvature towards posterior extremity, 87 µm in length, conical, evenly tapered towards tail-tip and bluntly-pointed end. No sign of caudal glands and spinneret.

**Male:** Not found.

**Habitat& Locality**

Soil around the roots of host species Sagun *Tectona grandis*, Hazara Range, Rajaji National Park, 30°09'05.6"N 78°04'19.3"E.

**Distribution:** Russia-Far East.

**Remarks:** Female specimen of *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 fit well with the measurements and taxonomic-identification provided in literature and reported for the first time from India.

***Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 (Figure 2. A-D)**

**Measurements:** *Female (1)*: L= 1.98 mm; a= 26; b= 4.2; c= 19; c'= 2.4; V= 65.

**Description**

Medium-sized stout nematode 1.98mm long. Posture upon fixation ventrally curved with more curvature towards ventral side. Lip region distinctly set off from the adjacent cephalic region with 36 µm width and 13 µm length. Buccal-cavity 41 µm long and 22 µm wide, strongly sclerotized buccal-walls. Dorsal-tooth apex sharply pointed anteriorly, located at 73% of buccal-cavity height from basal end and 27% height of buccal-cavity from frontal end. No evidence of longitudinal ridges on subventral walls of buccal-cavity. Pharynx length 473 µm. Pharyngo-intestinal junction non-tuberculate. Reproductive system amphidelphic, overlapping, with approximately evenly developed sexual branches on the either side of transverse slit-like vulval opening. Length of anterior gonadal branch from vulval opening 238 µm and that of posterior gonadal branch from vulval opening 225 µm. Tail with ventral curvature towards posterior end, 102 µm long, conical, evenly tapered towards tail-tip and narrowly-rounded end. Non-functional caudal glands with absence of spinneret.

**Male:** Not found.

**Habitat& Locality:** Soil around the roots of host species Sal *Shorea robusta*, Ramgarh Range, Asarori Comp. No. 10, Rajaji National Park, 30°13'49"N 77°58'58" E and Alt 696.380 feet.

**Distribution:** India, Mexico, Venezuela, Vietnam.

**Remarks:** *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 reported for the first time from Uttarakhand, India.

**DISCUSSIONS**

The present study from varied topography of Rajaji National Park discovered three species of *Coomansus* (Mononchida: Mononchidae), the type specimen *Coomansus parvus* (de Man, 1880) Jairajpuri & Khan, 1977 along with reported female specimen of *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 and *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982. The predatory genus *Coomansus* found from localities of Chilla Range, Gohri, Hazara Range and Ramgarh Range from a degree of variable host species namely Sal *Shorea robusta*, Sagun *Tectona grandis*, Papri *Holoptelea integrifolia*, Sheesham *Dalbergia sissoo* and other unidentified forest trees. The carnivorous *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977 reported from India for the first time after its discovery by Eroshenko, 1972 from Russia Far-East and *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982 recorded for the second time from India after the discovery of the same from Himachal Pradesh by Jairajpuri and Khan, 1982.

## CONCLUSIONS

Our subcontinent reported over 2500 of species of varied feeding-groups of nematodes, continued their existence in different niches over the past years. But their nature of surviving in almost all impossible ecosystems made scientists believe they exist in millions and from our country many thousands of nematode faunal diversity could be discovered. Our present survey one among those many attempts to reach the level of thousands of nematodes discovered from India. These current new records not only made addition in the predatory nematode species-list but also updated the Uttarakhand state faunal diversity as well as species-diversity of nematodes from India.

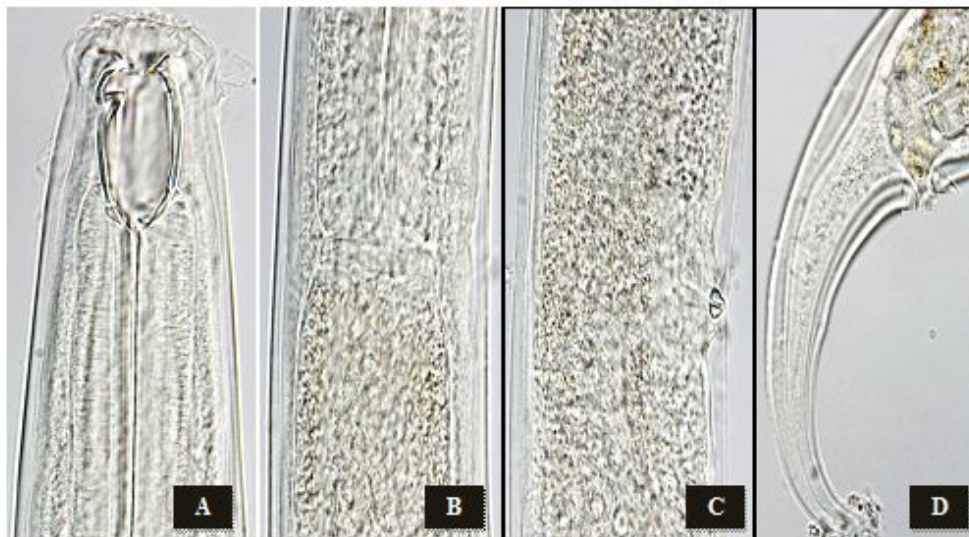


Figure 1: A-D: *Coomansus arvensis* (Eroshenko, 1972) Jairajpuri & Khan, 1977.  
A: Head, B: Pharyngo-Intestinal Junction, C: Vulval Region, D: Tail



Figure 2: A-D: *Coomansus venezolanus* (Loof, 1964) Jairajpuri & Khan, 1982.  
A: Head, B: Pharyngo-Intestinal Junction, C: Vulval Region, D: Tail

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